Georgia Gulf Chemicals & Vinyls, LLC
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26100 LA Highway 405
Post Office Box 629
Plaquemine, LA 70765-0629

MAIN FILE

original to TONEY
copy to HUGH Williams

January 19, 2006

Dr. Chuck Carr Brown
Assistant Secretary
Office of Environmental Services
Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313

Subject: **Georgia Gulf Chemicals & Vinyls, LLC, AI# 2455**
Permit No. LAD 057 117 434 – Industrial Furnace (INC-662)
Revised Trial Burn Plan Submittal

Dear Dr. Brown:

Georgia Gulf Chemicals & Vinyls, LLC's Plaquemine facility (GGCV) is submitting six (6) copies of the Revised Trial Burn Plan based on comments from letter dated November 17, 2005 for a test to be conducted on the Industrial Furnace (INC-662).

The following is a summary of the changes that have been made:

1. Trial Burn Plan, Page 3-1 references Condition 1 and Condition 2 testing with feed of TiO2 only in Condition 2. The implication is that no particulate sampling will be done in Condition 1. The facility must sample for particulate in condition 1 and state that such will be done.

   The plan has been changed to add particulate sampling during Condition 1.

2. Trial Burn Plan, Page 3-2, Tables 3-1 and 3-2 do not display identical parameters. The facility must display all critical parameters controlled in either Condition in both Tables to demonstrate what is or is not the same in different Conditions.

   The Tables have been updated.

3. Trial Burn Plan, Page 5-1 introduces the term "sub-samples". Sub-samples are samples split for duplicate analysis. The "sample" is the duplicate 125 ml samples drawn. The facility must explain what is done with the sample and how that sample is processed and analyzed.

   The wording has been changed to clarify the text.

4. Quality Assurance Project Plan (QAPP), Page 1-2 describes the trial burn lasting two days while Table 4-2 in the Trial Burn Plan identifies three days needed. The facility must use consistent scheduling in both documents.

   The QAPP has been modified to state that three days will be needed for the trial burn.

5. QAPP, Page 2-1describes the responsibility of METCO to include transporting samples to the laboratory while on page 2-2 Federal Express will be used for shipping samples. The facility must consistently describe what is expected during the Trial Burn and thereafter to ensure the chain-of-custody on the samples.

   The plan has been modified to show that samples analyzed in the METCO laboratory will be transported by METCO and that samples analyzed by STL Knoxville will be delivered to Federal express under chain-of-custody by METCOs' certified shipper for delivery to STL.

6. QAPP, Page 3-2, Item 3.3.1 describes the sampling location in vague terms. The facility must describe the sampling point(s) in terms cited in Method 1 about stack diameters upstream and downstream of obstructions. The facility must also evaluate the number of sample points across the stack from available information about the stack diameter and shape. Because of multiple layers of sampling ports the facility must describe the separation of sample ports in terms of feet and diameters.

   The text and the diagram have been modified.

7. QAPP, Page 7-2, Table 7-1 identifies sampling equipment that must be calibrated prior to the Trial Burn. During a previous history with Trial Burns on HAF 662, it was noted that readings taken in the control room and from field station indicators were not identical, but differed by significant values. The facility must identify continuous monitoring and controlling equipment that must be ensured to be in calibration prior to the Trial Burn. If control room and field instrument readings differ, such must be noted and the controlling instrument defined.

   The plan has been modified to indicate that all plant equipment will be calibrated before the Trial Burn and if readings should differ then the conflict will be resolved immediately.

If you have any questions concerning this correspondence, please contact Hillary Garner at 225-298-2632.

Sincerely,

Dennis C. Fec
Environmental Manager

DCF/HSG/tam

File 604.22.4 and 609.12.11

3226 Commander Dr.
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Quality Assurance Project Plan for Incinerator 662 Trial Burn

Georgia Gulf Chemicals and Vinyls, LLC

Plaquemine, Louisiana

October 2005
Revision 1: January 2006

Signature Page

Facility:	Georgia Gulf Chemicals and Vinyls, LLC (GGCV), Plaquemine, Louisiana
Unit ID:	Incinerator 662
Test Title:	Trial Burn

This Quality Assurance Project Plan (QAPP) has been developed for the trial burn to be conducted for GGCV's Incinerator 662. The QAPP was distributed to key project team members and laboratory contractors. The following individuals have reviewed the QAPP and agree to the appropriate information contained in the QAPP pertaining to their project responsibilities:

Hillary Garner
Georgia Gulf Chemicals and Vinyls, LLC
Test Burn Manager

Date

Robert Adams
METCO Environmental
Quality Assurance Officer

Date

Blair Shields
METCO Environmental
Project Director

Date

Signature Page

Facility: Georgia Gulf Chemicals and Vinyls, LLC (GGCV), Plaquemine, Louisiana
Unit ID: Incinerator 662
Test Title: Trial Burn

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Kevin Woodcock
Project Manager
Severn Trent Laboratories
5815 Middlebrook Pike
Knoxville, TN 37921

Date

(Laboratory signature page will be signed after QAPP is reviewed and approved by LDEQ.)

Table of Contents

List of Tables

List of Figures

List of Attachments

Section 1
Introduction

Georgia Gulf Chemicals and Vinyls, LLC (GGCV) is submitting this Quality Assurance Project Plan (QAPP) for the Incinerator 662 located at GGCV's Plaquemine, Louisiana, facility. The Incinerator 662 is subject to the Resource Conservation and Recovery Act (RCRA) codified in the Louisiana Administrative Code (LAC) Title 33, Part V, Subpart 1, Chapter 30. This Trial Burn Plan describes the tests to be performed during the Trial burn on the Incinerator 662. The Trial burn is being performed to collect the data necessary to demonstrate compliance with destruction and removal efficiency standards, and particulate matter, hydrogen chloride and chlorine requirements. This QAPP describes the quality assurance and quality control (QA/QC) program associated with the trial burn to be conducted for the incinerator.

1.1 Facility Overview

The GGCV facility is located adjacent to the Mississippi River. The plant is approximately five kilometers (km) southeast of Plaquemine, Louisiana and 20 km south of Baton Rouge, Louisiana. The facility is surrounded by land used primarily for industrial and agricultural purposes. The facility produces various chemical products and intermediates.

The street address of the GGCV Plaquemine facility is:

Georgia Gulf Chemicals and Vinyls, LLC
26100 Louisiana HWY 405
Plaquemine, Louisiana 70764

All correspondence should be directed to the facility contact at the following address and telephone number:

Hillary Garner
Georgia Gulf Chemicals and Vinyls, LLC
P.O. Box 629
Plaquemine, Louisiana 70765-0629
(225) 298-2632

GGCV operates a Halogen Acid Furnace in the Ethylene Dichloride/Vinyl Chloride Monomer (EDC/VCM) production unit under a hazardous waste and Title V permit. Incinerator 662 consists of a horizontal furnace and integrally designed horizontal boiler. After flowing through the waste heat boiler, the combustion gases are routed to the HCl recovery system consisting of

four absorber units. The gas then flows through a vertical packed tower fume scrubber. The bottom section of the scrubber removes the residual HCl. The top section is a caustic scrubber to maintain the desired pH of the scrubber liquor. Finally, the exhaust gas vents to the atmosphere through a mist eliminator section in the scrubber.

1.2 Trial Burn Program Summary

GGCV intends to perform one test condition to collect the data necessary to determine the destruction and removal efficiency (DRE) and demonstrate compliance particulate matter and hydrogen chloride/ chlorine (HCl/Cl_2) requirements.

The Trial burn is being coordinated by METCO, Inc. (METCO) under the direction of GGCV personnel. METCO Environmental (METCO) will perform all of the stack sampling for the test program. METCO will be responsible for all emissions and waste feed samples collected during the test program. The emissions and waste feed samples will be sent to the following laboratories for analysis: METCO and Severn Trent Laboratories, Inc. B3 Systems, Inc. will provide spiking services for this project.

GGCV anticipates conducting the trial burn in January 2006. The testing is expected to take three days. The Trial Burn Report will be submitted 90 days after completion of all emissions testing.

1.3 Laboratory Subcontractors

Severn Trent Laboratories of Knoxville, Tennessee (STL) will be the subcontractor laboratory. Laboratory contact information is provided in Attachment 1. The point of contact is Mr. Rich LaFond for STL

The QAPP has been submitted to the laboratory for their review and understanding of their project responsibilities.

1.4 Quality Assurance Project Plan Organization

This QAPP has been prepared following the USEPA document entitled *Preparation Aids for the Development of Category I Quality Assurance Project Plan* (USEPA, February 1991). The QAPP will serve as an essential guidance by which the trial burn will be performed. The QAPP defines all aspects of QA/QC procedures and establishes sampling and analytical quality indicators that will demonstrate achievement of the test objectives. Additionally, this QAPP defines precision and accuracy criteria for all of the required measurements that will be used to demonstrate that all associated test data are of sufficient quality. The remaining sections of the QAPP provide the following information:

- Section 2 presents information on the trial burn project team;
- Section 3 describes the trial burn sampling procedures;
- Section 4 presents sample handling and documentation information;
- Section 5 discusses analytical procedures;
- Section 6 presents the trial burn data quality objectives;
- Section 7 discusses calibration procedures and preventative maintenance;
- Section 8 discusses data reduction, validation and reporting procedures;
- Section 9 discusses quality assurance reports;
- Attachment 1 includes laboratory contact information;
- Attachment 2 includes contractor contact information; and
- Attachment 3 includes project team resumes

Section 2
Organization of Personnel, Responsibilities, and Qualifications

GGCV, METCO, the subcontracted laboratories, and B3 Systems, Inc. has specific unique duties in the implementation of the trial burn project. The project organization is shown in Figure 2-1. Key personnel contact information is summarized in Attachment 2. Resumes for key project team members are provided in Attachment 3. Equally, qualified personnel will replace any key personnel that become unavailable. The project team duties are summarized as follows.

GGCV, through the Test Burn Manager, will:

- Report all feed rates and incineration system process parameters;
- Operate the incineration system;
- Procure and prepare waste feeds; and

METCO, through the Project Director, will:

- Serve as liaison with regulatory agencies and the trial burn team;
- Provide oversight for the project; and
- Collect waste samples,
- Implement the quality assurance (QA) program for the emissions testing and sample analysis;
- Provide custody of all samples generated by the test efforts;
- Transport the samples to the METCO laboratory and ship the samples to the STL laboratory for analysis; and
- Prepare the stack and process sampling report and supporting documentation.

B3 Systems, Inc., through the spiking crew, will:

- Perform spiking of chlorobenzene; and
- Provide a spiking data report.

The subcontracted laboratory will:

- Perform sample analyses;
- Perform method and QAPP specified QA/QC;

- Provide a detailed Case Narrative; and
- Generate an analytical data report in a CLP-like format, as appropriate.

The Quality Assurance Officer will:

- Oversee sampling and analysis procedures;
- Provide input and document corrective actions; and
- Review all analytical results.

2.1 GGCV Test Burn Manager

Hillary Garner will serve as the GGCV Test Burn Manager. She will be responsible for directing GGCV personnel in the operations of the incineration system during the testing. She will also ensure that all necessary incinerator operating data is collected during the test.

2.2 METCO Project Director

Blair Shields of METCO will serve as the Project Director for the GGCV trial burn. He will be responsible for technical supervision of the project, data interpretation, and overall report preparation. He will coordinate with all laboratories and outside service providers. He will be the main contact for all laboratories and will supervise the shipment of all samples.

2.3 METCO Field Testing Supervisor

Jervey Cheveallier will serve as the Field Testing Supervisor. He will oversee the METCO field crew during the testing. He will be responsible for all aspects of sample collection and will report any deviations immediately to the Test Burn Manager and Project Director. He is METCO's Certified Shipper and will be responsible for shipment of all samples to the laboratories. The samples will be packaged according to Department of Transportation (DOT) and International Air Transport Association (IATA) regulations. METCO will transport the particulate and HCl/Cl_2 to the METCO laboratory and Federal Express will transport the samples to the STL laboratory.

2.4 Field Team

The Field Team will be made up of METCO personnel. METCO will be responsible for collecting all waste feed samples. METCO personnel, under the supervision of the Field Testing Supervisor, will collect all stack gas samples.

2.5 Quality Assurance Officer

The Quality Assurance Officer will have overall QA authority for all aspects of the trial burn. The Quality Assurance Officer is organizationally independent of the trial burn technical staff and is not directly responsible for making any measurements during the test. Dr. Robert Adams of METCO has been selected as the Quality Assurance Officer.

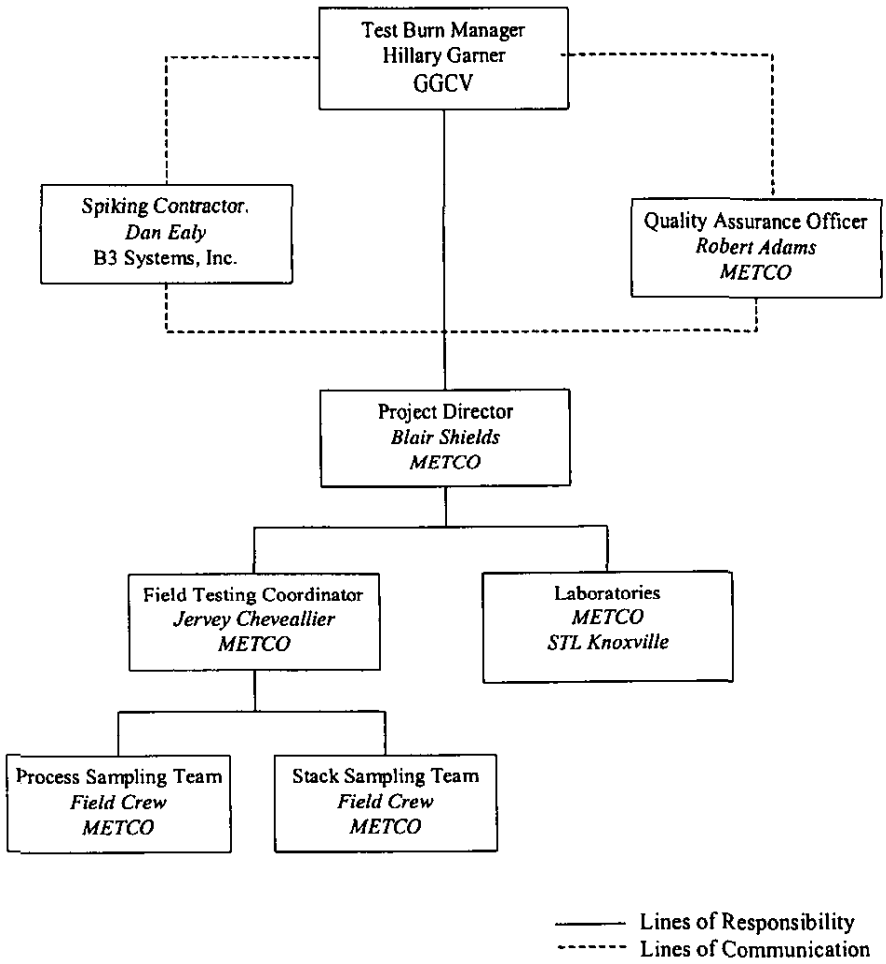
Specifically the Quality Assurance Officer is responsible for the following:

- Resolving any potential conflicts with laboratories conducting the analyses and communicating all changes to the Field Testing Supervisor prior to the actual stack testing;
- Coordinating with the Test Burn Manager, the Project Coordinator, and agency personnel to resolve any conflicts during the testing;
- Providing laboratory communications oversight prior to, during, and after the sampling activities take place;
- Providing documentation of all laboratory communications for the duration of the project to ensure that potential QA/QC issues encountered during sample collection, analysis and data validation are accounted for in the assessment of data usability;
- Providing oversight for sample handling, shipment and laboratory receipt, after the samples have been taken;
- Providing final data validation through a review of all laboratory reports for data quality issues, including review of case narratives for acceptability; and
- Providing a QA summary report that includes a listing of all deviations from the Trial Burn Plan or QAPP with corrective actions and the affect on data quality.

2.6 B3 Task Leader

Mr. Dan Ealy will serve as the off-site Program Manager for B3. B3 was founded in 1991 and has extensive experience in the spiking of metals and organic compounds. Mr. Ealy will ensure that the spiking crew is staffed with experienced technicians.

Figure 2-1
Project Organization



Section 3
Sampling Procedures

This section provides descriptions of the process and stack sampling procedures to be performed during the trial burn.

3.1 Waste Feed Sampling Procedure

METCO personnel will collect the liquid waste samples from taps located in the feed line. Samples will be collected at thirty-minute intervals during each test run. Approximately 250-mL of the liquid waste stream will be collected in two separate 125-mL glass jars. The sub-samples for each liquid waste stream from each test run will be composited in the field in one-gallon jars, and two 500-mL composite samples per liquid waste per run will be sent to the laboratory in a chilled container for analysis. Two 500-mL jars of the composited samples will be archived on-site as back up

Two 40-mL volatile organics analysis (VOA) sample vials will also be collected for each liquid waste stream at thirty-minute intervals during each test run. These samples will be composited in the laboratory before analysis. The cold samples will be emptied into a single narrow mouth glass container for the composite and a single VOA will be filled from the composite. As is standard laboratory procedure, the time associated with making the composite will be minimized, thereby minimizing the potential for loss of volatiles.

3.2 Process Vent Sampling and Analysis

The process vents will not be sampled and analyzed for the trial burn. Process knowledge will be used to characterize these feed streams. Information on the process vent streams was provided in the Trial Burn Plan.

3.3 Stack Gas Sampling Procedures

The stack gas sampling will follow the methods documented in 40 CFR Part 60, Appendix A (USEPA Methods) and *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA, April 1998) (SW-846). Any modifications to prescribed USEPA or SW-846 test methods will be outlined in the sampling procedure descriptions below. Pretest and post-test leak checks will be performed for each sampling train, as required by the respective test methods. Leak checks will also be performed at port changes. All sampling trains will be assembled and recovered in a mobile laboratory to ensure a clean environment. Table 3-1

summarizes the sampling procedures to be used during the trial burn for collection of stack gas samples.

Table 3-1
Stack Gas Sampling Summary

Parameter	Sampling Method	Sample Fraction
Gas flow rate, composition, and moisture content	USEPA Methods 1-4	Not applicable
Particulate matter, hydrogen chloride, chlorine	USEPA Methods 5/26A	Filter
		Front-half acetone rinse
		Sulfuric acid impingers contents and rinses
		Sodium hydroxide impingers contents and rinses
Monochlorobenzene	SW-846 Method 0030	Tenax™ resin
		Tenax™ resin/charcoal
		Condensate

3.3.1 Sampling Point Determination – USEPA Method 1

The number and location of the gas sampling points will be determined according to the procedures outlined in USEPA Method 1. Verification of absence of cyclonic flow will be conducted before testing by following the procedure described in USEPA Method 1. For the isokinetic sampling trains, six points will be sampled from each of two ports for a total of twelve sampling points. A stack diagram is provided as Figure 3-1.

3.3.2 Flue Gas Velocity and Volumetric Flow Rate – USEPA Method 2

The flue gas velocity and volumetric flow rate will be determined according to the procedures outlined in USEPA Method 2. Velocity measurements will be made using Type S pitot tubes conforming to the geometric specifications outlined in USEPA Method

2. Differential pressures will be measured with fluid manometers. Effluent gas temperatures will be measured with thermocouples equipped with digital readouts.

3.3.3 Flue Gas Composition and Molecular Weight – USEPA Method 3

The composition of the bulk gas and the gas molecular weight at the stack (concentration of carbon dioxide and oxygen) will be determined by USEPA Method 3. An integrated sample of gas will be extracted throughout each run and collected in a Tedlar bag for each run. The sample will be analyzed for carbon dioxide and oxygen using an Orsat analyzer. The calculated molecular weight will be used for all isokinetic calculations.

3.3.4 Flue Gas Moisture Content – USEPA Method 4

The flue gas moisture content will be determined in conjunction with each isokinetic train according to the sampling and analytical procedures outlined in USEPA Method 4. The impingers will be connected in series and will contain reagents as described for each sampling method. The impingers will be housed in an ice bath to assure condensation of the moisture from the flue gas stream. Any moisture that is not condensed in the impingers is captured in the silica gel. Moisture content is determined by weighing the various sample fractions.

3.3.5 Particulate Matter, Hydrogen Chloride, and Chlorine-USEPA Method 5 and 26A

The sampling methodology of USEPA Method 5 and 26A will be used to determine Particulate matter, hydrogen chloride, and chlorine. The sampling train will consist of a glass/quartz fiber, one knockout impinger containing 50 mL of 0.1 N sulfuric acid (optional), two impingers containing 100 mL of 0,1 N sulfuric acid, an empty impinger, two impingers each containing 100 mL of 0.1 N sodium hydroxide and an impinger containing at least 250 grams of silica gel.

All sampling train components will be constructed of materials specified in the methods and will be cleaned and prepared per method specifications before testing. A minimum of 45 dry standard cubic feet (dscf) will be collected over a minimum of 120 minutes. The probe and filter temperature will be maintained between 248 degrees Fahrenheit (°F) and 273 °F. The sampling runs will be performed within ± 10 percent of isokinetic conditions.

Sample recovery procedures will follow those outlined in the test method. Recovery of the USEPA Method 5/26A sampling train will result in four sample fractions. Sample

fractions are listed in table 3-1. The filter fraction will be packaged in a Petri dish for shipment. All rinses and impinger contents will be collected and shipped in amber glass jars. A field blank will be recovered during the testing program along with blanks of each reagent used at the test site.

3.3.6 Monochlorobenzene – SW-846 Method 0030

SW-846 Method 0030 Volatile Organic Sampling Train (VOST) will be used to sample stack emissions for determination of monochlorobenzene.

The VOST system draws effluent stack gas through a series of sorbent traps. The first trap will contain Tenax™ resin, and the second will contain a section of Tenax™ followed by a section of activated charcoal. A water-cooled condenser will be arranged so that condensate will drain vertically through the traps. New Teflon sample transfer lines will be used, and the sampling train will use greaseless fittings and connectors. The Tenax™ resin will be cleaned and tested, before testing, according to the QA requirements of the method.

Sampling will take place for 160 minutes per test run. Sampled gas will be passed through each pair of traps for 40 minutes. Four pairs of traps will be collected per run. One sample of condensate will be collected per VOST sampling run (four pairs). Three of the four pairs of VOST tubes will be analyzed for each run. The fourth will be archived and analyzed if any of the other three tube sets cannot be analyzed. The VOST probe will be kept at or above 130 degrees Celsius (°C) during sampling. The VOST will be operated at a sampling rate of approximately 0.5 liters per minute (L/min) for a total of 20 L (liters) per sample.

Each pair of traps will be analyzed separately to measure VOST breakthrough. Breakthrough is present if the catch on the second tube exceeds 30 percent of the catch on the first tube and is above 75 nanograms (ng).

Extra sorbent cartridges will be taken to the sampling site to serve as field and trip blanks. One pair of VOST tubes, designated as a field blank, will be exposed to the ambient air at the sampling location. The exposure time will correspond to the amount of time required to load and unload a pair of VOST tubes onto the sampling train. The tubes will be collected and recovered for each run.

A diagram of the sample system is presented in Figure 3-6.

3.4 Sampling Quality Control Procedures

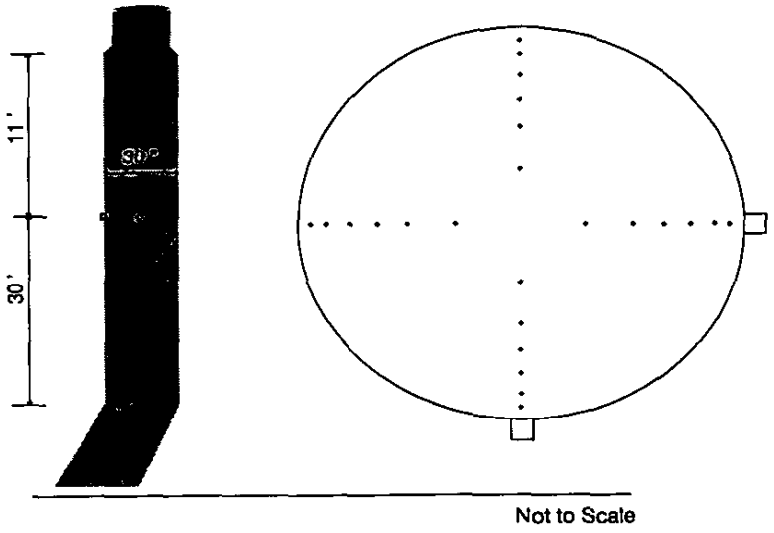
Specific sampling QC procedures will be followed to ensure the production of useful and valid data throughout the course of this test program.

Before the start of testing, all sampling equipment will be thoroughly checked to ensure clean and operable components and ensure that no damage occurred during shipping. Once the equipment has been set up, the manometer used to measure pressure across the pitot tube will be leveled and zeroed and the number and location of all sampling traverse points will be checked.

To ensure that the sampling trains are free of contamination, all glassware will remain sealed until assembly of the sampling train. The trains will be assembled in a clean environment, free of uncontrolled dust.

At the start of each test day and throughout the testing, all sample train components will be checked to ensure they remain in good condition and continue to operate properly. Electrical components will be checked for damaged wiring or bad connections. All glassware will be inspected to make sure no cracks or chips are present. Care will be taken to make sure that all sampling trains are being operated within the specifications of their respective method. At the end of testing each day, all sampling equipment will be sealed and covered to protect from possible contamination and weather damage.

Figure 3-1
Stack Diagram



The sampling ports are located 30 feet (4.40 stack diameters) downstream from a bend in the stack and 11 feet (12.00 stack diameters) upstream from a constriction in the stack. The inside diameter of the stack is 30 inches. The locations of the sampling points were calculated as follows:

Point Number	Percent of Diameter From Wall	Distance From Wall
1	2.1	1 "
2	6.7	2 "
3	11.8	3 9/16 "
4	17.7	5 5/16 "
5	25.0	7 1/2 "
6	35.6	10 11/16 "
7	64.4	19 5/16 "
8	75.0	22 1/2 "
9	82.3	24 11/16 "
10	88.2	26 7/16 "
11	93.3	28 "
12	97.9	29 "

Figure 3-2
USEPA Method 5/26A Sampling Train for Particulate Matter, Hydrogen Chloride and Chlorine

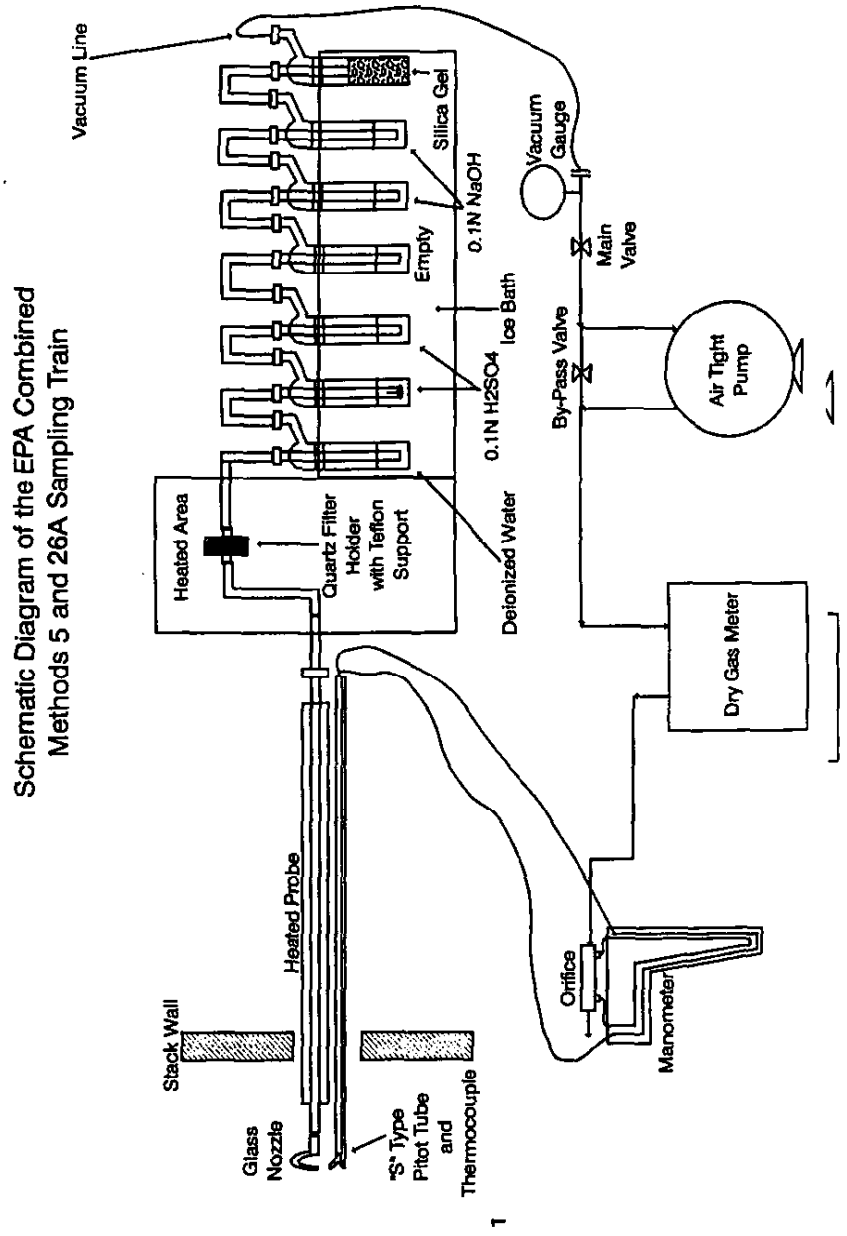
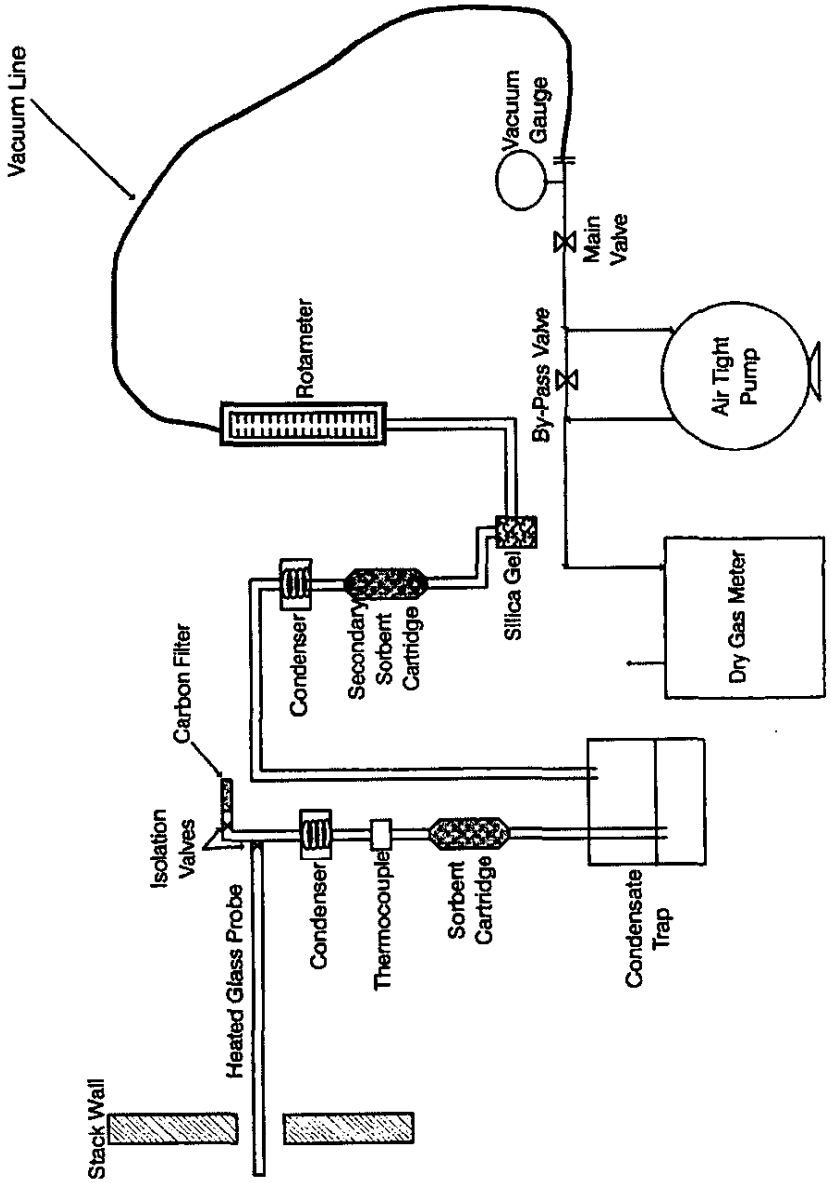


Figure 3-3

SW-846 Method 0030 Sampling Train



Section 4
Sample Handling and Documentation

Sample custody procedures for this program are based on procedures from the *Handbook: QA/QC Procedures for Hazardous Waste Incineration* (USEPA, 1990) (QA/QC Handbook) and SW-846, Chapter 1. The procedures that will be used are discussed below.

4.1 Field Sampling Operations

METCO will be responsible for ensuring that custody and sample tracking documentation procedures are followed for the field sampling and field analytical efforts. Documentation of all sample collection activities will be recorded on METCO's data collection forms. Table 4-1 provides a summary of sample custody documentation requirements.

Table 4-1
Sample Custody Documentation Requirements

Custody Document	Required Information
Sample ID log	List of all samples taken
	Time and date of sampling
	Description of sample
	Unique identifier for each sample
Sample data forms	Sampler's name
	Date and time of sample collection
	Sampling technique
	Compositing technique (waste samples)
	Sample identifier
	Sampling location
Chain of custody	Identifier of every sample shipped
	Sample preservation requirements
	Analysis and preparation procedures requested
	Signature of individual relinquishing sample custody

Upon receipt by the laboratory, information pertaining to the samples will be recorded on the sample tracking and custody form or an attachment to the form. The laboratory will note the overall condition of the samples, including the temperature of the samples upon receipt. The laboratory will also note any discrepancy in sample ID between the sample labels and the custody forms provided. The signature of the person receiving the samples will be provided on the chain of custody (COC).

Every record pertaining to sample collection activities, including, but not limited to, stack sampling data sheets, process sample data sheets, sample tracking forms, sample identification log, sampling equipment calibration forms, balance calibration forms, and reagent preparation will be submitted with the report to provide evidence that the samples were handled properly, taken at the correct time and in the correct manner, assigned a unique identifier, received intact by the laboratory, and preserved as appropriate. Adherence to the holding times indicated in Section 5, Tables 5-1 and 5-2, will be noted in the laboratory analytical results.

Samples will be collected, transported, and stored in clean containers that are constructed of materials inert to the analytical matrix, such as glass jars. Only containers that allow airtight seals will be used. Amber glass will be employed when specified by the method.

Stack sampling data, including information regarding sampling times, locations, and any specific considerations associated with sample acquisition will be recorded on preformatted data sheets.

The sample ID log will be completed in advance. Unique sample identification numbers will be recorded on each sample bottle label, in the sample identification log, and on the sample tracking forms.

Waste feeds that are collected will be packed by METCO for transfer or shipment to the laboratory. Sample tracking and custody forms, which include sample identification and analysis requests, will be enclosed in the sample shipment container.

4.2 Field Laboratory Operations

METCO will provide an on-site laboratory trailer for sample train assembly and recovery and documentation and record keeping activities. Sample tracking documentation, shipping records, reagent and standards traceability, and all sampling activity records will be maintained in the laboratory trailer.

Documentation of on-site analysis activities, such as calibration, standards traceability, sample preparation steps, and raw measurement results will also be maintained on site.

Section 5
Analytical Procedures

The analytical methods to be used during this test effort are detailed in Table 5-1 and 5-2. Table 5-1 presents the analytical methods for waste samples. Table 5-2 presents the analytical methods for stack gas samples. These tables present the referenced analytical method, the laboratory performing the analysis, the extraction and analysis holding time, and if required, the sample preservation and sample preparation method. Collection of these samples is described in Section 3. Note that the tables in Section 3 specify which samples are to be collected using which methods. The tables included in this section specify the preparation and analytical methods to be used to evaluate each sample.

Table 5-1
Sample Preparation and Analysis Procedures for Waste Samples

Parameter	Analytical Method	Lab	Extraction Holding Time (days)	Analysis Holding Time (days)	Preservative Required	Preparation Method
Higher heating value	ASTM Method D240	STL	NA [1]	180	NA	NA
Total Chlorine/chloride	SW-846 Method 9056	STL	NA	28	NA	SW-846 Method 5050
Specific gravity	ASTM Method D1298	STL	NA	180	NA	NA
Ash	ASTM Method D482	STL	NA	NA	NA	NA
Metals (except mercury)	SW-846 Method 6010B	STL	NA	180	NA	SW 846 Method 3050B
Monochlorobenzene	SW-846 Method 8260B	STL	NA	14	Ice	SW-846 Method 5030B

[1] Not applicable.

Table 5-2
Sample Preparation and Analysis Procedures for Stack Gas Samples

Parameter	Analytical Method	Lab	Extraction Holding Time (days)	Preservative Required	Analysis Holding Time (days)	Preparation Method
Molecular weight	USEPA Method 3	NA [1]	NA	NA	NA	NA
Moisture	USEPA Method 4	NA	NA	NA	NA	NA
Particulate Matter	USEPA Method 5	METCO	NA	NA	40	NA
Hydrogen chloride and chlorine	USEPA Method 26A	METCO	NA	NA	28	NA
Monochlorobenzene	SW-846 Method 8260B	STL	NA	Ice	14	SW-846 Method 5041A

[1] Not applicable.

Section 6
Data Quality Objectives

The purpose of this trial burn is to collect emission data for use measuring DRE, Particulate matter, and HCl/Cl_2. GGCV is committed to ensuring that the data generated during this project are scientifically valid, defensible, complete, and of known precision and accuracy. These objectives can be best achieved by applying the requirements of USEPA-accepted methodology as well as the more specific recommendations and guidelines specific to test burns. To ensure the consistency and adequacy of plans, reports, and overall data quality, guidance from the following documents have been integrated into the approaches and philosophies in this QAPP:

- SW-846, Chapter One; and
- QA/QC Handbook.

Although the QA/QC procedures included in the QA/QC Handbook lack the statistical approach in establishing acceptance criteria for the specified methodology, this document does provide specific guidance for test burns. It is important that these objectives be defined in terms of project requirements, not in terms of the capabilities of the test methods used, per se. In this context, QA objectives should not only be attainable by the chosen methods of sampling, sample preparation, and analysis, but should indicate the quality necessary to draw valid conclusions regarding the achievement of the objectives of the program, such as provided in the QA/QC Handbook. Key measures of successful achievement, which apply to all environmental measurement programs, include the objectives for precision, accuracy, representativeness, completeness, and comparability (commonly referred to as PARCC parameters).

This section presents project-specific data quality objectives for this trial burn. These objectives represent the level of data quality that would be considered acceptable for valid decision-making, as measured in a manner that best reflects performance in the actual project matrices.

6.1 Quality Control Parameters

Quality control (QC) parameters include precision, accuracy, representativeness, comparability, and completeness. Typical QC parameters include matrix spikes (MSs), matrix spike duplicates (MSDs), laboratory control samples (LCSs), laboratory control sample duplicates (LCSDs), surrogates, standards, spikes, and duplicates. Tables 6-1 and 6-2 provide the project specific QC procedures for assessing accuracy and precision measurements for critical measurement parameters. Critical parameters are those that directly relate to the demonstration of regulatory

compliance. These tables list the parameter of analysis, QC parameter, QC procedure, frequency at which accuracy and precision are determined, and objective.

Table 6-1
Quality Control Objectives for Waste Feed Samples

Analytical Parameters	QC Parameter	QC Procedure	Frequency	Objective
Higher heating value	Precision	Field duplicate	1 per Trial Burn	<20% RPD
Total chlorine/chloride	Precision	Field duplicate	1 per Trial Burn	<20% RPD
Specific gravity	Precision	Field duplicate	1 per Trial Burn	<20% RPD
Ash	Precision	Field duplicate	1 per Trial Burn	<20% RPD
Metals (SW-846 Methods 6010B and 7471A)	Accuracy	LCS	1 per Trial Burn	80-120% recovery
	Precision	Field duplicate	1 per Trial Burn	<25% RPD
Monochlorobenzene [1] (SW-846 Method 8260B)	Accuracy	Surrogates	Every sample	50-130% recovery
	Accuracy	MS	1 per trial burn	50-130% recovery
	Precision	MSD	1 per trial burn	< 50% RPD [2]

[1] MSs are not applicable on samples with greater than 0.1% of the target analyte.

[2] *If the concentrations are less than five times the reporting limit, the laboratory will be unable to control these limits.*

Table 6-2
Quality Control Objectives for Stack Gas Samples

Analytical Parameters	QC Parameter	QC Procedure	Frequency	Objective
Hydrogen chloride and chlorine	Accuracy	LCS	Per batch	80-120% recovery
	Accuracy	MS	Per batch	90-110% recovery
	Precision	MSD	Per batch	≤ 25% RPD
Monochlorobenzene	Accuracy	LCS	Per batch	50-150% recovery
		Surrogates	All samples	50-150% recovery
	Precision	LCSD	Per batch	≤ 25% RPD

6.1.1 Precision

Precision is a measure of the reproducibility of results under a given set of conditions. It is expressed in terms of the distribution, or scatter, of replicate measurement results, calculated as the relative standard deviation (RSD) or, for duplicates, as relative percent difference (RPD). RPD and RSD values are calculated using the following equations:

$$RPD = \left(\frac{|X_1 - X_2|}{avg.X} \right) x\,100$$

$$RSD = \left(\frac{STDDEV}{avg.X} \right) x\,100$$

Where X_1 and X_2 represent each of the duplicate results.

6.1.2 Accuracy

Accuracy is a measure of the difference between an analysis result and the "true" value. Accuracy is expressed in terms of percent recovery (*e.g.*, for surrogates, spikes, and reference material) and is calculated using the equation below:

$$\%\,Recovery = \left(\frac{SSR - SR}{SA} \right) x\,100$$

Where: SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

6.1.3 Representativeness

Representativeness is defined as the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, process condition, or an environmental condition. An appropriate sampling strategy that addresses collection of representative samples in time and space is crucial to subsequent decision-making and defensibility of the data. There are no numerical objectives for representativeness. The selection of suitable locations and sampling strategies, as described in this QAPP, and adherence to sample collection protocols, are the bases for ensuring representativeness.

6.1.4 Comparability

Comparability is defined as expressing the confidence with which one data set can be compared to another. There are no numerical objectives for comparability. A representative sample whose results are comparable to other data sets is ensured primarily with standard reference sampling and analytical methods. Reported in common units, the results generated should thus be comparable to those obtained from other emissions tests and allow for consistent decision-making.

6.1.5 Completeness

Completeness is defined as "the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under optimal normal conditions." Completeness can be defined quantitatively using the equation below:

$$\%\,\text{Completeness} = \left(\frac{\text{No. of Valid Data}}{\text{No. of Data Planned}} \right) \text{x } 100$$

In the overall project context, the target is 100 percent completeness, which for a valid test condition, is defined as consisting of three valid test runs. A valid test run is one in which sufficient valid data are presented to make any necessary demonstrations and to enable the permit writer/reviewer to write appropriate permit conditions or to be confident about demonstration of compliance with a current permit.

A run can be valid even though the completeness objective of 100 percent for the data package is not achieved. Given the possibility of human error (and other unpredictable problems) and the unfeasibility of collecting additional samples after a test is completed, the impact of achieving less than 100 percent completeness must be assessed in the specific situation, rather than arbitrarily rejecting all the useable scientific information for the run without such consideration. For example, satisfying the completeness objective

for a single piece of analytical data includes providing documentation that proves the following:

- An acceptable number of sub-samples were collected and composited;
- Compositing procedures were followed;
- The sample collection log was completed;
- Shipping documents and laboratory instructions were prepared and followed;
- The correct analytical procedures were followed;
- Any necessary modifications to methodology were documented and justified;
- Approved laboratory records were complete;
- Proper data reduction procedures were followed; and
- Analytical instrument printouts were included.

Clearly, the failure of a sampler to note the time a sub-sample was taken (where the previous and following sample times are noted) has less impact on the validity and acceptability of a data package than a failure by the laboratory to demonstrate that the analytical instrument was properly calibrated.

Any errors or omissions in a data package will be identified and accompanied by a discussion of potential impact on the validity of the data package, the conclusions of the report, and the demonstration of performance standards for the consideration and approval of the Louisiana Department of Environmental Quality (LDEQ).

6.2 Evaluation of Contamination Effects

Various blanks will be collected throughout the test program to evaluate the effects of contamination on results. Field blanks will be collected and analyzed to evaluate the impact of the sampling train recovery process on test results. Blank samples of all reagents used in the stack-sampling program will also be collected and archived. In the case of VOST analysis, an additional pair of tubes, designated as a trip blank, will be transported to and from the field and otherwise treated as the other cartridges, except that the caps will not be removed. These reagent blanks and trip blanks will only be analyzed in the event of an unsatisfactory field blank result. Method blanks will be analyzed by the respective laboratories to evaluate the cleanliness of sample handling and preparation, and overall laboratory practices. All of these blanks provide critical information on the potential contamination that may occur in test program samples. The results of blank analyses can prove very useful when attempting to understand anomalies in data, or generally higher than expected test results.

Since field and reagent blanks cannot be collected for waste samples, the laboratory method blank will be used to determine the effects of contamination for waste analyses. The same criteria will apply to the waste method blanks as the stack method blanks. Table 6-3 provides the type and analysis criteria for each stack blank to be analyzed.

Table 6-3
Blank Analysis Objectives for Stack Gas Samples

Analytical Parameters	Blank Type	Frequency	Objective
Hydrogen chloride and chlorine	Field blank	One per test	<Reporting limit [1]
	Method blank	One per batch	<Reporting limit [1]
Monochlorobenzene	Field blank	One per test	<Reporting limit
	Method blank	One per batch	<Reporting limit
	Reagent blanks	One set per test	Archived [2]

6.3 Performance Audits

In order to further evaluate data quality, audit samples may be provided by the regulatory agency. These samples are to be submitted to the respective laboratory and analyzed with the test sample batch.

6.3.1 VOST Audit

If available, a VOST Audit may be performed with regulatory oversight. GGCV will coordinate the VOST Audit through the USEPA. The cylinder custody seal will only be broken in the presence of a government representative. If a government representative is not present, the VOST audit will not be performed.

The cylinder will be sampled in the presence of the LDEQ auditor on the first day of testing. The audit will be performed following all instructions provided in the VOST kit and audit cylinder. The VOST Audit will be conducted according to the Standard Operating Procedures for Performance Audits provided by USEPA Region VI. Additional audit samples at other volumes may be taken and the volumes will be documented.

VOST Audit results will be distributed as soon as available. The VOST Audit results and any other audit results will be included in the final report. Justification for any problems

or deficiencies will be included and addressed with the submittal of the audit results and in the regulatory test report.

6.3.2 Other Audits

If an audit for particulate matter or HCl/Cl_2 is supplied, the METCO laboratory will analyze them and include the results in the test report.

6.4 Corrective Action

During any testing project, simple or complex, there is potential that deviations from data quality objectives may occur. This section gives corrective action procedures to be used to mitigate such problems.

6.4.1 Equipment Failure

Any equipment found to be out of calibration or operating improperly will be repaired or replaced before additional measurements are made. If equipment repair is made on site, calibrations will be performed in accordance with the applicable USEPA or SW-846 methods prior to use. It may be necessary to transport equipment off-site for calibration. If calibrations cannot be performed, the equipment will not be used. If measurements are made with equipment subsequently found to be out of calibration or operating improperly, a detailed explanation of the cause of the malfunction will be provided. The effect of the malfunction on the data will be assessed and the data will be qualified.

6.4.2 Analytical Deviations

For analyses where a method QC check sample, such as method blank, does not meet method specifications, the problem will be investigated to determine the cause as well as any corrective action that should be taken. Once the corrective action has been taken, the analysis will be re-examined to verify that the problem has been eliminated.

In instances of out of specification spikes or calibrations, the samples involved will be re-extracted or re-analyzed if possible. In those instances where re-analyzing the sample is not possible, such as in the case of VOST analysis, corrective measures will be taken to improve method performance prior to analysis of the next batch of samples.

6.4.3 Contamination

METCO's handling procedures for sorbent traps during all phases of the project, from blank testing to sample collection and analysis, are designed to eliminate contamination in field blank sorbent traps by limiting their exposure to contaminants in the ambient air.

If levels of contamination are present above the reporting limits in the field blanks, trip blanks will be analyzed. Corrective action will be taken if the field blanks are significantly different from the trip blanks. METCO will follow the blank correction procedures presented in the relevant method protocol. This comparison will indicate whether high levels in the field blank are due to contamination from exposure to ambient air or from degradation of the sorbent traps. If blank correction is applied, results both with and without the correction will be reported in the report.

6.4.4 Procedural Deviations

Standard Operating Procedures that have been approved by LDEQ through the Louisiana Environmental Laboratory Accreditation Program (LELAP) will be available on-site during all testing. GGCV and METCO's project management team will determine an appropriate action in all cases where standard procedures cannot resolve the problem. The action will be implemented after approval from the representatives of the LDEQ.

Section 7
Calibration Procedures and Preventative Maintenance

This section presents a brief discussion of calibration and routine maintenance procedures to be used for sampling and analytical equipment. Criteria for analytical calibrations are also included. Calibration procedures for each analytical method are discussed in detail within the methods themselves.

7.1 Sampling Equipment

All sampling equipment will be provided by METCO. METCO will calibrate the equipment before arrival on site. The equipment will also be calibrated after all testing has been completed. The sampling equipment calibration requirements and acceptance limits are listed in Table 7-1. All Georgia Gulf Monitoring equipment will be calibrated before to the trial burn. Any discrepancies in measurements will be resolved as soon as noted.

The equipment is calibrated according to the criteria specified in the reference method being employed. In addition, METCO will follow the guidelines set forth in the *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods* (USEPA, 1994). When these methods are inapplicable, METCO will use methods such as those prescribed by the American Society for Testing Materials (ASTM). Dry gas meters, orifices, nozzles, and pitot tubes are calibrated in accordance with these documents. The range of the calibration is specified for all environmental measurements to encompass the range of probable experimental values. This approach ensures that all results are based upon interpolative analyses rather than extrapolative analyses. Calibrations are designed to include, where practical, at least four measurement points evenly spaced over the range. This practice minimizes the probability that false assumptions of calibration linearity will be made. In addition, it is common practice to select, when practical, at least one calibration value that approximates the levels anticipated in the actual measurement.

Data obtained during calibrations are recorded on standardized forms, which are checked for completeness and accuracy by the Quality Assurance Officer. Data reduction and subsequent calculations are performed using METCO's own computer software. Calculations are checked at least twice for accuracy. Copies of calibration forms will be included in the test or project reports.

Table 7-1
Sampling Equipment Calibration Requirements

Stack Gas Parameter	Quality Parameter	Method of Determination	Frequency	Criteria
Gas flow	Pitot tube angle and dimensions	METCO Wind Tunnel	Pre-test Post-test	To specifications in USEPA Method 2
	Barometer	Calibrated vs. National Weather Service Station	Pre-test Post-test	Within 0.1 in. Hg
	Stack gas thermocouple	Calibrated vs. ASTM Hg-in-glass thermometer	Pre-test Post-test	Within 1.5% as degrees Rankin (°R)
Isokinetic sampling trains	Dry gas meter	Calibrated against a reference wet test meter	Pre-test Post-test	Y within 0.05 of pretest Y; H@ within 0.15 of pretest
	Probe nozzle [1]	Measurements with a vernier micrometer to 0.001 in.	Pre-test	Maximum difference in any two dimensions within 0.004 in.
	Dry gas meter thermocouples	Calibrated vs. ASTM Hg-in-glass thermometer	Pre-test Post-test	Within 1.5% as °R
	Trip balance	Calibrated vs. standard weights	Pre-test	Within 0.5 g
Non-isokinetic sampling trains	Dry gas meter	Calibrated against a reference wet test meter	Pre-test Post-test	Y within 0.05 of pretest Y; H@ within 0.15 of pretest
	Dry gas meter thermocouples	Calibrated vs. ASTM Hg-in-glass thermometer	Pre-test Post-test	Within 1.5% as °R
Waste Feed			Pre-test	Per manufacturer's specification

[1] Glass or Quartz nozzles will be used and the calibration cannot change.

7.1.1 Pitot Tubes

Each pitot tube is inspected in accordance with the geometry standards contained in USEPA Method 2. A calibration coefficient is calculated for each pitot tube based on the wind tunnel.

7.1.2 Differential Pressure Gauges

Fluid manometers do not require calibration other than leak checks. Manometers are leak-checked in the field before each test series and again upon completion of testing.

7.1.3 Digital Temperature Indicator

One digital temperature indicator is used to determine the flue gas temperature, probe temperature, oven temperature, impinger outlet temperature, and dry gas meter temperature. The digital temperature indicator is calibrated over a seven-point range (32

to 450°F) using an ASTM mercury-in-glass thermometer as a reference. The calibration is acceptable if the agreement is within ±1.5 percent in degrees Rankin (°R) in the temperature range of 50 to 180°F.

7.1.4 Dry Gas Meter and Orifice Curve

A calibrated wet test meter is used to calibrate the dry gas meter. The full calibration procedure is used to obtain the calibration factor of the dry gas meter. Once the dry gas meter has been calibrated an orifice curve may be completed.

- Dry Gas Meter – Each metering system receives a full calibration prior to testing
- Orifice Curve – An orifice calibration factor is calculated for each of the eighteen flow settings after a full calibration.

7.1.5 Barometer

The stack sampling contractor personnel will calibrate the barometer before arrival on site against a National Weather Service Station.

7.1.6 Nozzle

Glass nozzles will be calibrated on site using a micrometer. Eight readings will be taken at quarter turns, followed by two measurements at random. The arithmetic average of the values obtained during the calibration is used.

7.2 Analytical Equipment

Analytical equipment calibration and quality control procedures and internal quality control checks are included to ensure accuracy of the measurements made by laboratory equipment. Table 7-2 provides a summary of the calibration and quality control checks included for each analytical method for this test program.

Table 7-2
Summary of Analytical Equipment Calibration and Quality Control Checks

Parameter	Quality Control Check	Method of Determination	Frequency	Acceptance Criteria
Hydrogen chloride and chlorine	Initial calibration	Four Levels	Initially and as needed	$r \geq 0.995$
	Continuing calibration	Midpoint standard	Every 10 samples	± 10 % difference
	Initial calibration verification	Instrument calibration verification (ICV)	Following initial calibration	± 10 % difference
Monochloro-benzene	Initial calibration	Five levels,	Initially and as needed	≤15% RSD – Linear RF; >15% RSD (M8000b, §7.0); SPCC RRF >0.30 for chlorobenzene CCC <15% RSD
	Continuing calibration	Continuing Calibration Verification	Every 12 hours following tune as required	SPCC RRF >0.30 for chlorobenzene, CCC <20% RSD
	Consistency in chromatography	Internal standards	Every sample and standard	+/- 30 seconds (RRT) and 50-200%R

7.3 Waste Spiking Equipment

B3 will perform a calibration check for the spiking equipment before the Trial Burn.

7.4 Preventative Maintenance

To ensure the quality and reliability of the data obtained, preventative maintenance is performed on the sampling and analytical equipment. The following outlines those procedures.

7.4.1 Sampling Equipment

METCO minimizes the potential impact of equipment malfunction on data completeness through two complimentary approaches. First, an in-house equipment maintenance program is part of routine operations. The maintenance program's strengths include:

- Availability of personnel experienced in the details of equipment maintenance and fabrication;
- Maintenance of an adequate spare parts inventory; and
- Availability of tools and specialized equipment.

For field equipment, preventive maintenance schedules are developed from historical data. Table 7-3 gives specific maintenance procedures for field equipment.

. Table 7-3
Maintenance Activities For Field Sampling Equipment

Equipment	Maintenance Activities	Spare Parts
Vacuum system	Before and after field program: 1) Check oil and oiler jar. 2) Leak check. 3) Vacuum gauge is functional. Yearly or as needed: 1) Replace valves in pump.	Spare fluid
Inclined manometer	Before and after each field program: 1) Leak check. 2) Check fluid for discoloration or visible matter. Yearly or as needed: 1) Disassemble and clean. 2) Replace fluid.	Spare fluid, o-rings
Dry gas meter	Before and after each field program: 1) Check meter dial for erratic rotation. Every 3 months: 1) Remove panels and check for excessive oil or corrosion. 2) Disassemble and clean.	None
Nozzles	Before and after each test: 1) No dents, corrosion or other damage. 2) Glass or quartz nozzles, check for chips and cracks.	Spare nozzles
Diaphragm pump	Before and after each test: 1) Leak check. Change diaphragm if needed.	None
Orsat analyzer	Before each test: 1) Leak check. 2) Inspect for damage.	Reagents, reservoirs
Tedlar bags	Before each test: 1) Leak check. 2) Inspect for damage.	Spare bags
Miscellaneous		Fuses, fittings, thermocouples, thermocouple wire, variable transformers.

7.4.2 Analytical Equipment

In addition to including quality control checks in the analysis of test program samples, the laboratories also perform regular inspection and maintenance of the laboratory equipment. Table 7-4 lists some of the routine maintenance procedures associated with the analytical equipment to be used in this test program.

Table 7-4
Maintenance Activities for Analytical Equipment

Parameter	Equipment	Maintenance Procedures
Hydrogen chloride and chlorine	Ion chromatograph	▪ Check pump and gas pressure ▪ Check all lines for crimping leaks and discoloration
Monochloro-benzene	GC/MS	▪ Clean source, trap, injector, seal and transfer line ▪ Change sparge vessel, filament and septa ▪ Change pump oil

Section 8
Data Reduction, Validation and Reporting

This section presents the approaches to be used to reduce, validate, and report measurement data. This discussion includes an annotated report outline and describes the reporting conventions that will be applied.

With respect to the GGCV project and the Trial Burn Plan, a quality team of companies and laboratories are working together to insure the success of this project. The team will ensure that:

- All raw data packages are paginated and assigned a unique project number. Each project number will reflect the type of analyses performed (*i.e.*, organic, inorganic, waste feed, air emissions).
- The data packages contain a case narrative, sample description information, sample receipt information, chain of custody documentation, and summary report. All associated QA/QC results, Run/Batch data, instrument calibration data, sample extraction/prep logs, and chromatograms, etc. will be included in the final laboratory report.
- These data are assigned to a specific Appendix in the stack sampling report for easy reference and data review.

The project team routinely compiles large emission test reports that contain all the information in an organized fashion.

8.1 Data Reduction

The methods referenced in this QAPP for field measurements and lab analyses are standard methods and routinely used for such measurements and analysis. Data reduction procedures will follow the specific calculations presented in the reference methods.

Extreme care will be exercised to ensure hand recorded data are written accurately and legibly. Additionally, prepared and formatted data recording forms will be required for all data collection. This is an important aid to verify that all necessary data items are recorded. The collected field and laboratory data will be reviewed for correctness and completeness.

METCO will reduce and validate all of the sampling and field measurement data that are collected. The sampling data will include flow measurements, calibrations, etc. Each laboratory

will reduce all analytical results before their submission to METCO. The analytical data will be used to determine concentrations and emission rates of the compounds of interest. The manner in which the derived quantities will be reported is discussed in Section 8.3.

8.2 Data Validation

Validation demonstrates that a process, item, data set, or service satisfies the requirements defined by the user. For this program, review and evaluation of documents and records will be performed to assess the validity of samples collected, methodologies used, and data reported. This review comprises three parts: review of field documentation, review of laboratory data reports, and evaluation of data quality.

The sampling and analytical methods for this program have been selected because of their accepted validity for these types of applications. Adherence to the accepted methods, as described in this QAPP, is the first criterion for validation. The effectiveness of the analytical methods as applied to this particular study will be evaluated based on project-specific quality indicators, such as audit samples, replicate samples, matrix, and surrogate spikes.

8.2.1 Review of Field Documentation

Sample validation is intended to ensure that the samples collected are representative of the population under study. Criteria for acceptance include positive identification, documentation of sample shipment, preservation, and storage, and documentation demonstrating adherence to sample collection protocols and QC checks.

As part of the review of field documentation, field data sheets and master logbooks will be checked for completeness, correctness, and consistency. The following specific items will be checked:

- Sample collection date;
- Sample identification, type and volume;
- Analysis requested;
- Any comments that may affect interpretation of results;
- Number of required field QC samples (*i.e.*, field blanks, field duplicate samples, matrix spikes);
- Sample tracking documentation; and
- Documentation of calibration procedures for field instruments and other field parameters, such as isokinetics, temperatures, volumes, and sampling durations.

8.2.2 Review of Laboratory Data Reports

Both the Quality Assurance Officer and stack sampling contractor personnel will perform a qualitative evaluation of the reported data to verify:

- Adherence to holding time requirements;
- Completeness of target analyte lists;
- Correctness of reporting limits;
- Correctness and consistency of measurement units;
- Inclusion of necessary flags and meaningful comments regarding data;
- Adherence to specified analytical methodologies; and
- Sample tracking documentation.

8.2.3 Evaluation of Data Quality

Stack sampling contractor personnel will review field and laboratory documentation to assess the following indicators of data quality:

- Integrity and stability of samples;
- Performance of instruments used for analysis;
- Possibility of sample contamination;
- Identification and quantitation of analytes;
- Precision; and
- Accuracy.

This review will be based on evaluation of documentation by the laboratory project manager, laboratory technical reviewers, and stack sampling contractor personnel for each of the following, as appropriate to the analytical method:

- Analytical and preparation methods used;
- Sample preservation and custody documentation;
- Instrument tuning - mass spectrometer;
- Initial calibration;
- Continuing calibration verification;
- Blank analyses;
- Duplicate samples;
- Laboratory control samples;
- Surrogate spike analyses; and
- Matrix spike analyses.

Review of the above documentation will result in an evaluation of the following parameters:

- Maximum holding time for samples from date of collection to date of preparation and/or analysis;
- Sample storage conditions during the holding period prior to analysis;
- Method used to tune and calibrate instruments;
- Tuning and calibration acceptance criteria;
- Acceptance criteria for matrix spike recoveries and matrix spike duplicate precision;
- Acceptance criteria for surrogate spike recoveries;
- Frequency of required blank sample analyses; and
- Frequency and type of performance evaluation sample analyses.

8.3 Data Reporting

All data will be reported in the appropriate units as applicable to the sample stream and the method of analysis. Waste feed analytical results will be reported as concentrations by weight. Emission results will be reported on both a concentration basis and a mass emission rate basis.

8.4 Report Contents

The Trial Burn Report will be submitted to LDEQ within 90 days of completing the testing. The Trial Burn Report will be based on the report format specified in the LDEQ's *Guidance For Organization, Content, and Format, Trial Burn Report* (LDEQ, December 2003). The analytical data packages will be provided in a CLP-like format, as appropriate.

8.5 Reporting Conventions

Specific procedures will be followed when reporting test results. This section describes the conventions for detection limits, correction of data due to background contamination, and the use of significant figures.

8.5.1 Management of Non-Detects

There are several specific situations that will arise in which calculations will need to be performed, but the analytical results are non-detects (at some level). This section presents a series of conventions that will be used for dealing with those situations.

Non-detects in the emissions will be reported as the reporting limit RL. For DRE calculation, a non-detect in the waste feed will be treated as a zero for purposes of calculation and a non- detect in the emissions will be treated as the reporting limit (with

a less-than sign) for the purposes of calculation. This will provide for the most conservative estimate of emission rates, DREs and control efficiencies in assessing the performance of the incinerator. Note that calculations of emissions using non-detects are reported as maxima (*i.e.* with less-than, <) and determination of DRE using non-detects are reported as minima (*i.e.* with a greater-than, >).

In cases where there is more than one component of a sampling train whose results need to be combined, the following guidelines will be used:

Case 1

All components of a train (or combined analysis) are non-detects. *In this case, the various detection limits will be summed according to the following equation:*

$$\text{Summed DL} = \Sigma(\text{DL}_{\text{Ind}})$$

Where:
Summed DL is the limit for the overall determination
DL_{Ind} is the detection limit for the particular specific measurement
Example: *If there are three separate VOST measurements which represent a run, and* all results are reported as <10 ng per tube pair, the summed result would be less than (10 + 10 +10) or 30 ng. This provides a conservative estimate of the emissions.

Case 2

One or more components of a train (or combined analysis) are non-detects, and there is at least one positive result. In this case, the non-detects and the positive results are summed and reported as a maximum.

Example: If there are three separate VOST measurements, which represent a run, and the results for the Tenax™ tube, show 15 ng but the Tenax™/charcoal and condensate showed less than 10 ng. The result would be reported as < 35 ng for the entire train.

8.5.2 Background Correction

Some of the methods specified for use in this test program allow background or blank correction. Every effort will be made to use reagents and sampling media of the highest quality to ensure that no contamination is indicated in any of the blank samples.

In the event that background contamination is found, any background or blank correction will be carefully documented, and all calculations (*e.g.*, emission rates) will be developed

using both corrected and uncorrected data. All corrections will be performed according to the applicable method.

8.5.3 Rounding and Significant Figures

Observational results will be made with as many significant figures as possible. Rounding will be deferred until all resultant calculations have been made. The following rules will be applied in rounding data:

- When the digit after the one to be rounded is less than five, the one to be rounded is left unchanged; and
- When the digit after the one to be rounded is greater than or equal to five, the one to be rounded is increased by one.

Intermediate results will be presented in the final report at an appropriate level of significance (*i.e.*, rounded, although the derived, or resultant, calculations will be based on unrounded intermediate data.) Consequently, it may not be possible to precisely reconstruct the resultant calculations on any particular table from the rounded intermediate results, due to rounding errors.

Section 9
Quality Assurance Reports

Activities affecting quality will be reviewed by the project team, daily in the field, and as appropriate during non-field efforts. This will allow assessment of the overall effectiveness of the QAPP. These reviews will include the following:

- Summary of key QA activities, stressing measures that are being taken to ensure adherence to the QAPP;
- Description of problems observed that may impact data quality and corrective actions taken;
- Status of sample shipment and integrity at time of receipt and progress of sample analysis;
- Assessment of the QC data gathered over that time period;
- Any changes in QA organizational activities and personnel; and
- Results of internal or external assessments and the plan for correcting identified deficiencies, if any.

The testing program to be conducted at GGCV will have multiple tiers of QA/QC reviews. The specific laboratory performing the analysis will review the data they are responsible for and the laboratory project manager will sign the analytical data reports. Any QA/QC anomalies will be discussed in the case narrative. METCO will also review the laboratory data package to discuss how the QA/QC anomalies may affect the emissions calculations. Any data that is determined to be invalid will be stated in the final report and the impact of the invalid data on the test program will be assessed. Through this multiple tier process, all stages of the testing program will be tracked, monitored, reviewed, and documented.

Section 10
References

USEPA. April 1998. Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods. USEPA 530/ SW-846 upd.5.

USEPA. 1994. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods. Office of Research and Development. EPA/600/R-94/038C.

USEPA. February 1991. Preparation Aids for the Development of Category I Quality Assurance Project Plan. Office of Research and Development. EPA/600/8-91/003.

USEPA. 1990. Handbook: QA/QC Procedures for Hazardous Waste Incineration. Office of Research and Development. EPA/625/6-89/023.

USEPA. New Source Performance Standards, Test Methods and Procedures, Appendix A, 40 CFR Part 60.

Attachment 1
Laboratory Contact Information

Laboratory Contact Information

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Ph: 865-291-3000
Fx: 865-584-4315
Attn: Rich LaFond

Attachment 2
Contractor Contact Information

Contractor Contact Information

METCO Environmental, Inc.

Mr. Blair Shields
3226 Commander Drive
Carrollton, TX 75006

Ph: 800-394-1194
Fx: 972-931-8398

B3 Systems, Inc.

Mr. Dan Ealy
7711 Welborn Street, Suite 106
Raleigh, NC 27615

Ph: 919-790-9090
Fx: 919-790-0550

Attachment 3
Project Team Resumes

THOMAS 'Blair' SHIELDS II; Project Manager

Education	B. S. Environmental Science, May 18, 1990; Concordia College, Bronxville, New York. M. S. Aquatic and Fisheries Science, May 13, 1995; University of Southwestern Louisiana, Lafayette, Louisiana.
Professional Training Courses	Attended a 40-hour Occupational and Environmental training program on Hazardous Materials (CFR 1910.120) in Baton Rouge, Louisiana, March of 1999. Also attended an 8-hour refresher course for CFR 1910.120 (given annually).
Certifications	Certified Visible Emissions Evaluator HAZMAT certified Adult CPR certified Standard First Aid certified
Technical Experience	Participated in the sampling of over 500 emission test programs programs (20 of which were trial burns of RCRA-permitted sources). Served as the Project Supervisor for more than 100 emission test programs, including several high-profile projects within the chemical and petrochemical industry where emission data was used for dispersion modeling and risk assessment purposes. Functioned as a Project Supervisor on projects requiring subcontractor support for spiking and EPA Method 18 analysis. Specifically has an established relationship with Field Portable Analytical, METCO's proposed EPA Method 18 subcontractor.

(continued)

Technical Experience (cont'd)

Emission testing experience includes project assignments in various industries such as:

- Power generation
- Petrochemical
- Synthetic Organic Chemical Manufacturing
- Chemical
- Pulp and paper
- Food
- Hazardous Waste Incineration

Tested sources include:

- Incinerators and Flares
- Thermal and Catalytic Oxidizers
- Wet and Dry Scrubbers of Various Designs
- Electrostatic Precipitators
- Turbines
- Boilers
- Process Vents in chemical, petrochemical, pulp and paper industries.
- Batch, Continuous, and Semi-continuous purposes.
- Data generated from these test programs has been used to:
    - Demonstrate compliance with permit conditions
    - Support revisions of permit conditions
    - Validate continuous emission monitor and control device performance
    - Support design of control devices
    - Support in-house engineering and evaluation projects

(continued)

SHIELDS, Blair (cont'd)

Technical Experience (cont'd)

Has performed on-site analysis for gravimetric particulate, sulfur trioxide (SO_3) and sulfur dioxide (SO_2).

Experienced in the sampling of commercial calibration gas cylinders for sulfur dioxide, oxides of nitrogen, carbon dioxide, oxygen, and carbon monoxide.

Thoroughly trained and experienced in the following EPA Methods:

- CFR Title 40, Chapter 1, Part 60, EPA Methods 1 through 17, 20, 23, 25A, 26A, and 29
- Methods 0010, 23A, 0030, 0060, and 0061
- Particle Size Distribution Analysis

Thoroughly trained in the operation and routine maintenance of the following:

- Thermo Environmental Model 10S Oxides of Nitrogen Analyzer
- Thermo Environmental Model 48 Carbon Monoxide Analyzer
- Teledyne Model 326 Oxygen Analyzer
- Western Research Model 721M Sulfur Dioxide Analyzer
- Horiba Model PIR 2000 Carbon Dioxide Analyzer
- J.U.M. Model VE-7 Total Hydrocarbon Analyzer
- ESC Data Acquisition System
- Thoroughly trained in the calibration techniques for all field testing equipment.

JERVEY C. CHEVEALLIER; Manager, Baton Rouge Operations

Education	B. S. in Wildlife and Fisheries, 1994; Louisiana State University; Baton Rouge, Louisiana.
Professional Training Courses	Attended 40-hour Occupational and Environmental training program on Hazardous Materials (CFR 1910.120) in Baton Rouge, Louisiana, March of 1999. Attended an 8-hour refresher course for CFR 1910.120 (given annually).
Certifications	Certified Visible Emissions Evaluator Certified in First Aid/CPR HAZMAT certified
Technical Experience	Participated in the sampling of over 500 sources (50 of which were trial burns). Serving in the supervisory capacity of over 300 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1996-present. Testing experience in various industries such as: • Power generation, • Cement, • Glass, • Food, • Oil and gas, • Pulp and paper, • Chemical, and • Incineration Supervised projects for Owens Brockway in Atlanta, Georgia; First Chemical in Pascagoula, Mississippi; U. S. Alliance in Coosa Pines, Alabama; and Pepperidge Farms in Richmond, Utah.

(continued)

CHEVEALLIER, Jervey (cont'd)

Technical Experience (cont'd)

Over three years experience with EPA and Texas Air Control Board (TACB) methods of sampling stationary sources.

Thoroughly trained in the following EPA Methods: CFR Title 40, Chapter 1, Part 60, EPA Methods 1 through 17, 20, 23, 25A, 26A, and 29.

Experience with sampling EPA Methods 0010, 23A, 0030, 0060, and 0061.

Experience with particle-size sampling with the Andersen Impactor method.

Has performed on-site analysis for gravimetric particulate, sulfur trioxide and sulfur dioxide.

Experienced in the sampling of commercial calibration gas cylinders for sulfur dioxide, oxides of nitrogen, carbon dioxide, oxygen, and carbon monoxide.

Thoroughly trained in the operation and routine maintenance of the following:

- Thermo Environmental Model 10S Oxides of Nitrogen Analyzer
- Thermo Environmental Model 48 Carbon Monoxide Analyzer
- Teledyne Model 326 Oxygen Analyzer
- Western Research Model 721M Sulfur Dioxide Analyzer

(continued)

CHEVEALLIER, Jervey (cont'd)

Technical Experience (cont'd)

- Horiba Model PIR 2000 Carbon Dioxide Analyzer
- J.U.M. Model VE-7 Total Hydrocarbon Analyzer
- ESC Data Acquisition System
- Thoroughly trained in the calibration techniques for all field testing equipment.

ROBERT E. ADAMS, Ph.D.; Project Manager

Education	Ph.D. Analytical Chemistry, 1977; University of Georgia, Athens, Georgia. B.S. Chemistry, 1971; University of North Carolina, Chapel Hill, North Carolina.
Professional Memberships	American Chemical Society Air and Waste Management Association Alpha Chi Sigma
Technical Experience	Participated in the sampling of multiple sources, including several of which were sampled simultaneously using more than one sampling train, from 1990-present. As a Quality Assurance Director, conducted quality audits, implemented new methods, and improved laboratory operations for several environmental laboratories. Also, worked to develop proposals and review reports. Supervised the development and reviewed, under stringent quality assurance/ quality control (QA/QC), generalized GC, HPLC, and GC/MS methods for the analysis of hazardous waste incinerator effluents. QA/QC plans were developed to control these experiments. Developed procedures for the analysis of volatile and semi-volatile organic compounds as an Organic Lab Manager. Managed the analysis of hazardous waste samples for EPA's Superfund program (2 contracts). This program involved the determination of volatiles and base/neutral/acid fractions by GC/MS and pesticides by GC/ECD.

(continued)

ADAMS, Robert E., Ph.D.; (continued)

Technical Experience (cont'd)

Thoroughly trained in the operation and routine maintenance of the following:

- Agilent 1090 HPLC
- Agilent 5971 GC/MS
- Agilent 5972 GC/MS
- Agilent 5973 GC/MS
- Agilent 5890 GC/FID/ECD/FPD
- Extractive FTIR
- Shimadzu GC 17 FID
- Shimadzu GC 14 FID/FPD
- Perkin-Elmer A Analyst Graphite Furnace AA
- Leeman Labs DRE ICP-AES
- Dionex 100 Ion Chromatograph

Professional Training Courses

Attended 40-hour Hazardous Waste Operations and Emergency Response in accordance with 29 CFR 1910.120, Dallas, Texas in February 2004. Also attended 8-hour HAZWOPER refresher course from 2005.

Certifications

Adult CPR certified
Standard First Aid certified
Hazwoper Certified

Publications and Presentations:

Adams, R.E.; Caudle, M.D. *The Use of Portable FTIR for Industrial Gas Analysis and Process Optimization*. Paper presented at the Air and Waste Management Association—Southern Section 2002 Annual Meeting and Technical Conference, Orange Beach, AL;

Weinberg, D.S.; Adams, R.E.; Manier, M.L. *Software Programs for Processing PCDF/PCDD GC/MS Data*. Paper presented at the 39th ASMS Conference on Mass Spectrometry and Allied Topics, Nashville, TN; 1991 May 19-24.

Publications and Presentations
(cont'd)

Weinberg, D.S.; Adams, R.E.; Manier, M.L. *Evaluation of a Particle-Beam Liquid Chromatograph/Mass Spectrometer.* Paper presented at the 39th ASMA Conference on Mass Spectrometry and Allied Topics, Nashville, TN; 1991 May 19-24.

Adams, R.E.; Hass, J.R.; Smith, W.S.; Wong, T. *Sampling and Analysis for Volatile and Semivolatile POHC During RCRA Trial Burns: Techniques and Problems.* Proceedings of the 80th annual meeting of the Air Pollution Control Association, New York, NY; 1987, June 21-26.

Adams, R.E.; James, R.H.; Burford, L.A.; Miller, H.C.; Johnson, L.D. *Analytical Methods for Determination of POHC in Combustion Products.* Environ. Sci. Technol. 20: 761-769; 1986. Paper presented at the Symposium on Organic Emission from Combustion, 187th ACS national meeting; 1984 April; St. Louis, MO.

Adams, R.E.;, Thomason, M.M.; Strother, D.L.; James, R.H.; Miller, H.C. *The Determination of PCDDs and PCDFs in PCB Oil From a Hazardous Waste Site.* Paper presented at the 5th International Symposium on Chlorinated Dioxins and Related Compounds. Bayreuth, Federal Republic of Germany; 1985, September 16-19. Chemosphere 15: 1113-1121; 1986.

James, R.H.; Adams, R.E.; Johnson, L.D. *A Simplified Sampling and Analysis System for the Determination of Volatile Organic Compounds in Combustion Effluents.* Proceedings of the 79th Annual Meeting of the Air Pollution Control Association. Minneapolis, MN; 1986, June 22-27.

James, R.H.; Adams, R.E.; Finkel, J.M.; Miller, H.C.; Johnson, L.D. *Evaluation of Analytical Methods for the Determination of POHC in Combustion Products.* J. Air Pollut. Control Assoc. 35: 959-989; 1985.

(continued)

ADAMS, Robert E., Ph.D.; (continued)

Publications and Presentations (cont'd)

James, R.H.; Adams, R.E.; Thomason, M.M.; Johnson, L.D. *Measuring Products of Combustion-Analytical Methods for POHCs and PICs.* Proceedings of the Fifth Annual National Symposium on Recent Advances in the Measurement of Air Pollutants. Raleigh, NC; 1985, May 14-16.

Thomason, M.M.; James, R.H.; Adams, R.E.; Johnson, L.D. *Products of Incomplete Combustion-Analytical Methods.* Proceedings of the Eleventh Annual Research Symposium on Land Disposal, Remedial Action, Incineration, and Treatment of Hazardous Waste. Cincinnati, OH; 1985, April 29-May 1.

Adams, R.E. *Positive and Negative Chemical Ionization Pyrolysis Mass Spectrometry of Polymers.* Anal. Chem. 55: 414-416; 1983. Paper presented at the 33rd Southeast regional ACS meeting. Lexington, KY; 1981 November.

Adams, R.E. *Pyrolysis Mass Spectrometry of Terephthalate Based Polyesters Using Chemical Ionization and Negative Ion Detection.* J. Polym. Sci. 20: 119-129; 1982. Paper presented at the Southeast-Southwest regional ACS meeting. New Orleans, LA; 1980 December.

Adams, R.E.; Carr, P.W. *Coulometric Flow Analyzer for Use With Immobilized Enzyme Reactors.* Anal. Chem. 50: 944-950; 1978. Invited paper at the 11th Great Lakes regional ACS meeting. Stevens Point, WI; 1977 June.

Adams, R.E.; Betso, S.R.; Carr, P.W. *Electrochemical pH-stat and Controlled Current Acid-Base Analyzer.* Anal. Chem. 48: 1989-1996; 1976. Paper presented at the 27th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. Cleveland, OH; 1976 March.

(continued)

ADAMS, Robert E., Ph.D.; (continued)

Publications and Presentations (cont'd)

Klatt, L.N.; Connell, D.R.; Adams, R.E.; Honigberg, I.L.; Price, J.C. *Voltametric Characterization of a Graphite-Teflon Electrode.* Analy. Chem. 47: 2470-2472; 1975.

Adams, R.E. Development and Application of a Totally Electrochemical pH-stat and Controlled Current Acid-Base Analyzer for Biological Studies. Athens, GA; University of Georgia; 1977. 151 p. Dissertation.

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Carrollton, TX 75006
Telephone (972) 931-7127
Fax (972) 931-8398

Trial Burn Plan for Incinerator 662

Georgia Gulf Chemicals and Vinyls, LLC

Plaquemine, Louisiana

October 2005

Revision 1: January 2006

Table of Contents

List of Tables

List of Figures

List of Appendices

Section 1
Introduction

Georgia Gulf Chemicals and Vinyls, LLC (GGCV) is submitting this Trial Burn Plan, for the Incinerator 662 operated at the Plaquemine, Louisiana, facility. The Incinerator 662 is subject to the Resource Conservation and Recovery Act (RCRA) codified in the Louisiana Administrative Code (LAC) Title 33, Part V, Subpart 1, Chapter 30. This Trial Burn Plan describes the tests to be performed during the Trial burn on the Incinerator 662. The Trial burn is being performed to collect the data necessary to demonstrate compliance with destruction and removal efficiency standards.

1.1 Facility Overview

The GGCV facility is located adjacent to the Mississippi River on over 2,000 acres, most of which is located to the southwest of State Highway 30. The plant is approximately five kilometers (km) southeast of Plaquemine, Louisiana and 20 km south of Baton Rouge, Louisiana. The facility is surrounded by land used primarily for industrial and agricultural purposes. The facility produces various chemical products and intermediates.

The street address of the GGCV Plaquemine facility is:

Georgia Gulf Chemicals and Vinyls, LLC
26100 Louisiana HWY 405
Plaquemine, Louisiana 70764

All correspondence should be directed to the facility contact at the following address and telephone number:

Hillary Garner
Georgia Gulf Chemicals and Vinyls, LLC
P.O. Box 629
Plaquemine, Louisiana 70765-0629
(225) 298-2632

GGCV operates a Halogen Acid Furnace in the Ethylene Dichloride/Vinyl Chloride Monomer (EDC/VCM) production unit under a hazardous waste and Title V permit. Incinerator 662 consists of a horizontal furnace and integrally designed horizontal boiler. After flowing through the waste heat boiler, the combustion gases are routed to the HCl recovery system consisting of four absorber units. The gas then flows through a vertical packed tower fume scrubber. The bottom section of the scrubber removes the residual HCl. The top section is a caustic scrubber to maintain the desired pH of the scrubber liquor.

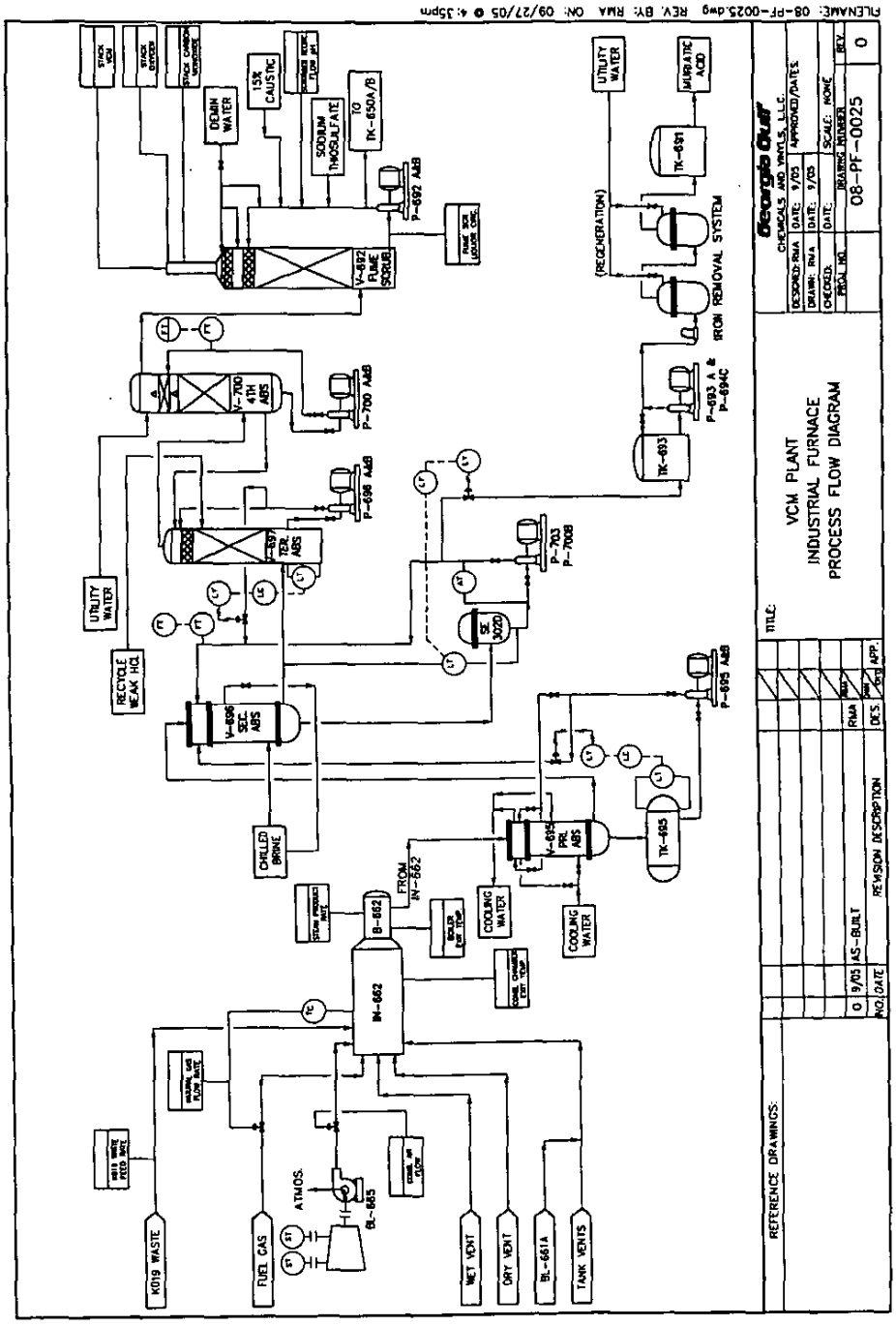
Finally, the exhaust gas vents to the atmosphere through a mist eliminator section in the scrubber. A process flow diagram is provided in Figure 1-1.

1.2 Trial Burn Program Summary

GGCV intends to perform two test conditions. One test condition will be conducted to collect the data necessary to determine the destruction and removal efficiency (DRE) at low temperature. The second test condition will be conducted to demonstrate compliance with particulate matter and hydrogen chloride/ chlorine (HCl/Cl_2) requirements. The demonstration of DRE at maximum feed conditions was demonstrated during a 1998 Trial burn. GGCV plans to continue to use this data for the demonstration of DRE at maximum waste feed rate.

The Trial burn is being coordinated by METCO, Inc. (METCO) under the direction of GGCV personnel. METCO Environmental (METCO) will perform all of the stack sampling for the test program. METCO will be responsible for all emissions and waste feed samples collected during the test program. The emissions and waste feed samples will be sent to the following laboratories for analysis: METCO, and Severn Trent Laboratories, Inc.

Figure 1-1
Process Flow Diagram



1.3 Test Plan Organization

The remaining sections of the Trial Burn Plan provide the following information:

- Section 2 presents information on the incinerator feed stream;
- Section 3 presents a description of the Trial burn operating conditions;
- Section 4 presents the schedule for the Trial burn;
- Section 5 presents a summary of the Trial burn sampling and analysis procedures;
- Section 6 presents a description of the Trial Burn Report;
- Section 7 presents references; and
- Appendix A includes the Quality Assurance Project Plan (QAPP).

Section 2
Waste Characterization

EDC (Ethylene Dichloride) Heavy Ends are the hazardous waste feed to this unit and carries the listing K019. Table 2.1 gives the profile of the waste stream. The incinerator has been designed to accommodate this waste stream as well as vent gases from the production unit at the Plaquemine facility.

Table 2-1
Typical Characteristics of the EDC Heavy Ends Waste Feed

Parameter	Units	Typical	Range
Total Chlorides	%	72	65-80
Ash Content	%	0.05	0.01-0.15
Heat of Combustion	Btu/lb	5000	
Organics:			
1,1,2,2-Tetrachloroethane	%	5	
1,1,2-Trichloroethane	%	40	30-45
1,2-Dichloroethane (EDC)	%	20	15-30
Tetrachloroethene	%	1.5	
Hexachloroethane	%	0.04	
Metals:			
Antimony	mg/L	<1.0	
Arsenic	mg/L	<1.0	
Barium	mg/L	<1.0	
Beryllium	mg/L	<0.2	
Cadmium	mg/L	<0.5	
Chromium	mg/L	<1.0	
Lead	mg/L	<0.5	
Mercury	mg/L	<0.1	
Nickel	mg/L	<1.0	
Selenium	mg/L	<0.5	
Silver	mg/L	<1.0	
Thallium	mg/L	<1.0	

Natural gas is used as a supplemental fuel during start-up and during normal operations to control temperatures in the incinerator. The natural gas is not expected to contain any regulated constituents, and the composition of this stream is not monitored. Table 2-2 presents data on the typical composition of natural gas.

Table 2-2
Typical Natural Gas Composition

Parameter	Units	Range
Net Heating Value	Btu/lb	24,000
Methane	wt %	95.0
Ethane	wt %	2.5
Nitrogen	wt %	1.5
Non-HAP Hydrocarbons	wt %	1.0

Section 3
Trial Burn Operations

GGCV intends to perform two test conditions to collect the data necessary to determine the destruction and removal efficiency (DRE) at low temperature and demonstrate compliance with particulate matter and hydrogen chloride/ chlorine (HCl/Cl_2) requirements. This section of the Plan establishes the incinerator operations that will be demonstrated during the trial burn. In addition, the preparation of materials to be fed during the test and the amount of waste to be used are presented.

3.1 Trial Burn Test Condition 1

The purpose of this test condition is to demonstrate compliance with the DRE standard and to establish a minimum temperature for introduction of hazardous wastes. The EDC Heavy Ends feed rate will be set at 5 gpm. Additionally monochlorobenzene (MCB) has been selected as the POHC. B-3 Systems, Inc. has been chosen as the spiking contractor to spike the POHC. B-3 plans to use MCB available at GGCV. It is anticipated that the MCB will be of high purity and will have a certificate of analysis to verify the actual purity. The MCB will be spiked at a rate of up to 100 lbs/hr. Additionally, particulate matter will be sampled during Test Condition 1.

The operating parameters for the trial burn condition are provided in Table 3-1. All flow rates, temperatures, and other operating data presented for the test condition are calculated target values; the actual conditions observed during the trial burn may vary slightly from these values.

3.2 Trial Burn Test Condition 2

The purpose of this test condition is to demonstrate compliance with the standards for particulate matter and chlorides emissions. The EDC Heavy Ends feed rate will be set at 10.3 gpm. B-3 Systems, Inc. has been chosen as the spiking contractor to supplement the ash content of the waste. B-3 plans to supply TiO_2 as the ash supplement. A 40% dispersion of TiO_2 is anticipated as the ash supplement but 60% dispersion may be used if available. The target rate for ash in the waste feed is 0.15%. If the density of the waste feed is close to that of water then the new target ash feed rate is 7.73 lbs/hr (old rate was 0.67 lbs/hr).

The operating parameters for the trial burn condition are provided in Table 3-1. All flow rates, temperatures, and other operating data presented for the test condition are calculated target values; the actual conditions observed during the trial burn may vary slightly from these values.

Table 3-1
Trial Burn Test Condition 1

Parameter	Units	Target Value
EDC Heavy Ends Flow Rate	Gpm	5
MCB feed rate	lbs/hr	up to 100
Combustion Chamber Temperature	F	2200
Ash Feed Rate	lbs/hr	N/A (amount determined by amount in waste feed)300 N/A (amount determined by amount in waste feed)
Scrubber Liquid Flow Rate	Gpmlbs/hr	
Chloride Feed Rate		

Trial Burn Test Condition 2

Parameter	Units	Target Value
EDC Heavy Ends Flow Rate	*Gpm*	10.3
Ash feed rate	lbs/hr	7.73
Chloride Feed Rate	lbs/hr	4550
Combustion Chamber Temperature	F	2200 (Shouldn't determine removal)
Scrubber Liquid Feed Rate	Gpm	300

3.3 Trial Burn Materials and Quantities

Table 4-4 summarizes the quantity of materials required to conduct the trial burn. Triplicate runs will be carried out for the test conditions. The trial burn will require approximately four hours for each run. The runs will be performed over three days. An additional hour of run time will be required for each day of testing in order to establish the steady state conditions before the start of the test runs. Therefore, for calculating trial burn material quantities, a total of 19 hours has been used. We have also added an additional 25 percent to each total to allow for unforeseen delays.

Table 3-2
Material Quantities for the Trial Burn

Parameter	*Units*	*Required Quantity*
EDC Heavy Ends waste feed	gal	11,740
MCB	lbs	2000 lbs
TiO_2	lbs	147

Section 4
Schedule

The trial burn is tentatively scheduled for February, 2006. This schedule provides time for review and approval of the Trial Burn Plan, preparation of feed materials, and mobilization for the test.

4.1 Overall Project Schedule

GGCV has developed a very aggressive schedule for the trial burn project. Key dates and milestones are outlined in Table 4-1.

Table 4-1
Trial Burn Project Schedule

Date	Weeks of Elapsed Time	Activity
October 2005	0	GGCV submits trial burn plan to LDEQ
October 2005	4	LDEQ completes initial review of the Trial Burn Plan and submits comments to GGCV
January 2006	12	GGCV submits responses to LDEQ comments
		GGCV begins preparations for Trial Burn
January 2006	12	LDEQ issues approval of the Trial Burn Plan
January 200-5	12	GGCV issues public notice for the Trial Burn sampling
February 2006	16	GGCV commences the Trial Burn sampling
February 2006	16	GGCV completes the Trial Burn sampling
April 2006	28	GGCV submits the Trial Burn Report to LDEQ

4.2 Trial Burn Schedule

GGCV intends to perform the trial burn during February 2006. The trial burn sampling effort will require three days. The stack-sampling contractor will mobilize the first day to set up for testing. During this period, sampling equipment and instruments will be prepared, calibrated, supplies will be brought on-site,

and sampling locations will be prepared for testing. Actual stack sampling for the trial burn test condition is expected to take two and a half (2 1/2) days.

The trial burn test conditions will require three replicate test runs. Although the on-site activities will dictate the actual timing, a preliminary test schedule is presented in Table 5-2.

- GGCV plans to allow approximately one hour for the incinerator to achieve steady-state operations before the test runs.

Table 4-2
Trial Burn Test Schedule

Day	Start	Stop	Activity
One	0700	1200	Set-up of sampling equipment and pre-test meetings
One	1200	1300	Establish steady state operating conditions for trial burn test condition 1
One	1300	1700	Trial burn Condition 1 – Run 1, recover Run 1
Two	0700	0800	Establish steady state operating conditions for trial burn test condition 1
Two	0800	1200	Trial burn Condition 1 – Run 2
Two	1200	1300	Set-up Condition 1 Run 3, recover Run 2
Two	1300	1900	Trial burn Condition 1 - Run 3, Recover Run 3
Three	0700	0800	Establish steady state operating conditions for trial burn test condition 2
Three	0800	1030	Trial burn Condition 2 – Run 1
Three	1030	1130	Set-up Condition 2 - Run 2, recover Run 1
Three	1130	1400	Trial burn Condition 2 – Run 2
Three	1400	1500	Set-up Condition 2 – Run 3, recover Run 2
Three	1500	1930	Trial burn Condition 2 – Run 3, Recover Run 3, break down sampling equipment

Section 5
Sampling and Analysis

Sampling and analysis performed during the trial burn test conditions described in Section 4 will collect the data necessary to measure DRE, particulate matter, and HCl/Cl_2. The test conditions will consist of three replicate test runs. For each run, samples will be collected using procedures described in the QAPP found in Appendix A.

Liquid waste and stack gas samples will be collected during the trial burn. This section of the Plan describes the sampling methods that will be employed. Since most of the proposed methods are standard reference methods, only brief descriptions are presented. Sample holding times will be consistent with the analytical requirements for the methods used. Descriptions that are more detailed can be found in the indicated reference documents and in the QAPP.

Table 5-1 summarizes the samples to be taken, the parameters to be measured, and the frequency of measurement.

5.1 Liquid Waste Sampling and Analysis

METCO personnel will collect the liquid waste samples from taps located in the feed line. Samples will be collected at thirty-minute intervals during each test run. Approximately 250-mL of the liquid waste stream will be collected in two separate 125-mL glass jars. The samples for each liquid waste stream from each test run will be composited in the field in one-gallon jars, and two 500-mL composite samples per liquid waste per run will be sent to the laboratory in a chilled container for analysis. Two 500-mL jars of the composited samples will be archived on-site as back up

Two 40-mL volatile organics analysis (VOA) sample vials will also be collected for each liquid waste stream at thirty-minute intervals during each test run. These samples will be composited in the laboratory before analysis. The cold samples will be emptied into a single narrow mouth glass container for the composite and a single VOA will be filled from the composite. As is standard laboratory procedure, the time associated with making the composite will be minimized, thereby minimizing the potential for loss of volatiles.

The liquid waste sample composites in 500-mL jars will be analyzed for higher heating value, total chlorine, ash, specific gravity, and metals; the VOA sample vial composites will be analyzed for monochlorobenzene to characterize the waste stream.

Table 5-1 summarizes the liquid waste samples to be taken, the parameters to be measured, and the frequency of measurement.

Table 5-1
Liquid Waste Sampling and Analytical Methods

Sampling Method	Sampling Frequency	Analytical Parameter	Analytical Method[1]
Tap Sampling – Glass Bottles	Every 30 minutes	Higher heating value	ASTM Method D240
		Total chlorine/chlorides	SW-846 Methods 5050 and 9056
		Specific gravity	ASTM Method D1298
		Ash	ASTM Method D482
		Metals[2]	SW-846 Methods 6010B and 7471A
Tap Sampling – VOA vials	Every 30 minutes	Monochlorobenzene	SW 846 Method 8260B

[1]SW-846 refers to *Test methods for Evaluating Solid Waste, Third Edition*, November 1986, and Updates. ASTM refers to American Society for Testing and Materials.

[2]Metals to be analyzed include antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, and thallium.

5.2 Process Vent Sampling and Analysis

The process vents will not be sampled and analyzed for the trial burn. Process knowledge will be used to characterize these feed streams.

5.3 Stack Gas Sampling and Analysis

The stack gas will be sampled for monochlorobenzene, particulate matter, and HCl/Cl_2. USEPA Methods 1 through 4 will be used to evaluate the stack port positions relative to obstructions, check for the absence of cyclonic flow, measure the stack gas velocity and volumetric flow rate, and determine the stack gas composition, molecular weight and moisture content.

The following sampling methods will be used during the trial burn test condition:

- A USEPA Method 5/26A sampling train will be used to sample the stack gas for measurement of particulate matter, HCl and Cl_2.
- A *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA, April 1998) (SW-846) Method 0030 sampling train will be used to sample the stack gas for measurement of monochlorobenzene. The samples will be analyzed using SW-846 Method 8260B.

Table 5-2 summarizes the stack gas samples to be taken, the parameters to be measured, and the frequency of measurement.

Table 5-2
Stack Gas Sampling and Analytical Methods

Sampling Method	Sampling Frequency/ Duration	Analytical Parameter	Analytical Method[1]
USEPA Methods 5/26A	2 hours	PM and HCl/Cl_2	USEPA 5/26A
SW-846 Method 0030	4 tube sets, 40-minutes per tube set	Monochlorobenzene	SW-846 5041A and 8260B

[1]SW-846 refers to *Test methods for Evaluating Solid Waste, Third Edition*, November 1986, and Updates. USEPA Method refers to New Source Performance Standards, Test Methods and Procedures, Appendix A, 40 CFR Part 60.

Section 6
Trial Burn Report

The Trial Burn Report will be submitted to LDEQ within 90 days of completing the testing. The Trial Burn Report will be based on the report format specified in the LDEQ's *Guidance For Organization, Content, and Format, Trial Burn Report* (LDEQ, December 2003). The report will use the following basic outline:

1.0 Summary of Test Results

2.0 Introduction/Process Description

3.0 Operating Data Summary Target Operating Conditions

4.0 Feed Stream Sampling and Analysis

5.0 Trial Burn Data Sampling and Analysis

6.0 Quality Assurance/Quality Control Documentation

Appendix A – Stack Sampling Report

Appendix B – Spiking Report

Appendix C - Feed Stream Sampling Report

Appendix D – Quality Assurance Report

Appendix E – Operating Data Report

Appendix F – Field Logs

Appendix G – Analytical Data Packages

Appendix H – Resumes

Section 7
References

Louisiana Administrative Code (LAC) Title 33, Part V, Subpart 1, Chapter 30

USEPA. April 1998. Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods. USEPA 530/ SW-846 upd.5.

USEPA. November 1994. Strategy for Hazardous Waste Minimization and Combustion. EPA530-R-94-044.

USEPA. New Source Performance Standards, Test Methods and Procedures, Appendix A, 40 CFR Part 60.

Appendix A
Quality Assurance Project Plan